

**THAT WHICH IS CLAIMED IS:**

1. A system for locating a wireless station in communication with a wireless local area network comprising:

5 a plurality of cells defining a wireless local area network (WLAN) and each having an access point base station and adapted for communicating with wireless mobile devices using wireless communications signals; and

10 a processor operatively connected to each of said access point base stations and operative to process communications signals transmitted from a mobile device and determining which signals are first-to-arrive signals based on a common timing signal and conducting differentiation of the first-to-arrive  
15 signals to locate the mobile device.

2. A system according to Claim 1, wherein said common timing signal comprises a wireless timing signal broadcast to each of said access point base stations.

3. A system according to Claim 2, wherein a mobile station located at a known location is operative for generating the common timing signal.

4. A system according to Claim 2, wherein an access point base station is operative for generating the common timing signal.

5. A system according to Claim 1, and further comprising a common bus operatively connected to each of said access point base stations through

which a common timing signal is provided to each access  
5 point base station.

6. A system according to Claim 1, wherein  
any communications signals transmitted from mobile  
devices further comprise a location pulse appended to  
the wireless communications signal.

7. A system according to Claim 6, wherein  
said location pulse is appended to a rising edge of the  
wireless communications signal transmitted from the  
mobile device.

8. A system according to Claim 6, wherein  
said location pulse is appended to the falling edge of  
the wireless communications signal transmitted from the  
mobile device.

9. A system according to Claim 1, and  
further comprising a network interconnecting each of  
said access point base stations and a server.

10. A system according to Claim 9, wherein  
said network comprises an ethernet local area network.

11. A system according to Claim 1, wherein  
said wireless communications signals comprise spread  
spectrum communications signals.

12. A system for locating a wireless station  
in communication with a wireless local area network  
comprising:

a plurality of cells defining a wireless  
5 local area network (WLAN) and each having an access  
point base station and adapted for communicating with

wireless mobile devices using wireless spread spectrum communications signals, each base station further comprising edge detection circuitry time for detecting  
10 the leading edge of a communications signal transmitted from a mobile device; and

a processor operatively connected to each of said access point base stations and operative to process the detected leading edge of received  
15 communications signals and determining first-to-arrive signals based on a common timing signal and conducting differentiation of the first-to-arrive signals to locate the mobile station.

13. A system according to Claim 12, wherein said common timing signal comprises a wireless timing signal broadcast to the edge detection circuitry of each of said access point base stations.

14. A system according to Claim 12, wherein a mobile device located at a known location is operative for generating the common timing signal.

15. A system according to Claim 12, wherein an access point base station at a known location is operative for generating the common timing signal.

16. A system according to Claim 12, and further comprising a common bus operatively connected to each of said access point base stations and edge detection circuitry through which a common timing  
5 signal is provided.

17. A system according to Claim 12, and further comprising a network interconnecting each of said access point base stations and a server.

18. A system according to Claim 17, wherein said network comprises an ethernet local area network.

19. A system for locating a wireless station in communication with a wireless local area network comprising:

5 a plurality of cells defining a wireless local area network (WLAN) and each having an access point base station and adapted for communicating with wireless mobile devices contained within a cell using wideband spread spectrum communications signals; and  
10 a correlator operative with each of said access point base stations and time referenced with a common timing signal for receiving a portion of a wideband spread spectrum communications signal received from a mobile device for determining first-to-arrive signals and conducting differentiation of the first-to-  
15 arrive signals to locate the mobile device.

20. A system according to Claim 19, wherein said correlator comprises a spread spectrum matched filter.

21. A system according to Claim 19, wherein said common timing signal comprises a wireless timing signal broadcast to each of said access point base stations.

22. A system according to Claim 19, wherein a mobile station located at a known location is operative for generating the common timing signal.

23. A system according to Claim 19, wherein an access point base station at a known location is operative for generating the common timing signal.

24. A system according to Claim 19, and further comprising a common bus operatively connected to each of said access point base stations through which a common timing signal is provided.

25. A system according to Claim 19, and further comprising a network interconnecting each of said access point base stations and said server.

26. A system according to Claim 25, wherein said network comprises an ethernet local area network.

27. A system for locating a wireless station in communication with a wireless local area network comprising:

5 a plurality of cells defining a wireless local area network (WLAN) and each having an access point base station time;

10 at least one wireless mobile station for communicating with said access point base stations and each comprising a wireless local area network (WLAN) transmitter for transmitting a wireless communication signal to base stations and a location transmitter for appending a spread spectrum location pulse onto one of a rising or falling edge of the wireless communication signal; and

15 a processor operatively connected to each of said access point base stations and operative to receive and process the appended location pulse from a mobile station and determining which signals are first-to-arrive signals based on a common timing signal and

20 conducting differentiation of the first-to-arrive  
signals to locate the mobile station.

28. A system according to Claim 27, and  
further comprising a radio frequency (RF) switch  
operatively connected to said WLAN transmitter and said  
location transmitter for allowing transmission through  
5 a common antenna.

29. A system according to Claim 28, and  
further comprising a signal detect circuit operatively  
connected to said WLAN transmitter and said location  
transmitter for triggering said location transmitter  
5 and said RF switch.

30. A system according to Claim 27, wherein  
each base station further comprises a location receiver  
for receiving the location pulse.

31. A system according to Claim 27, wherein  
said common timing signal comprises a wireless timing  
signal broadcast to each of said access point base  
stations.

32. A system according to Claim 27, wherein  
a mobile station located at a known location is  
operative for generating the common timing signal.

33. A system according to Claim 27, wherein  
an access point base station at a known location is  
operative for generating the common timing signal.

34. A system according to Claim 27, and  
further comprising a common bus operatively connected

to each of said access point base stations through which a common timing signal is provided.

35. A system according to Claim 27, and further comprising a network interconnecting each of said access point base stations and said server.

36. A system according to Claim 35, wherein said network comprises an ethernet local area network.